

This listing of claims will replace all prior versions, and listings, of claims in the application:

**Listing of Claims:**

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- 1) Claim 1 (amended): A method for increasing the dynamic range of a mass spectrometer having at least one quadrupole ion filter and one mass analyzer, comprising the steps of:
    - a. passing a first sample of ions through the quadrupole ion filter and the mass analyzer;
    - b. measuring the intensities of the mass spectrum of said first sample;
    - c. identifying undesired ions within said first sample from said measurement for ejection;
    - d. introducing a second sample of ions into the mass spectrometer;
    - e. applying the appropriate rf voltages to the quadrupole ion filter to eject the undesired ions; and
    - f. detecting the mass spectrum of the desired ions in the mass analyzer.
  - 2) (original) The method of claim 1 comprising the further step of accumulating the desired ions in a ion trap interposed between the quadrupole ion filter and the mass analyzer.
  - 3) (original) The method of claim 1 wherein detecting the mass spectrum of the desired ions is performed in a mass analyzer selected from the group consisting of an ion trap mass spectrometer and a Fourier transform ion cyclotron resonance mass spectrometer.
  - 4) (original) The method of claim 2 wherein detecting the mass spectrum of the desired ions is performed in a mass analyzer selected from the group consisting of an ion trap mass spectrometer and a Fourier transform ion cyclotron resonance mass spectrometer.

- 5) (original) The method of claim 1 wherein the ejection of the undesired ions is accomplished by applying resonant rf-only voltages to the quadrupole ion filter selected from the group consisting of dipolar excitation, quadrupolar excitation, and parametric excitation.
- 6) (original) The method of claim 2 wherein the ejection of the undesired ions is accomplished by applying resonant rf-only voltages to the quadrupole ion filter from the group consisting of dipolar excitation, quadrupolar excitation, and parametric excitation.
- 7) (original) The method of claim 1 wherein steps a-f are repeated to detect further undesired ions for ejection.
- 8) (amended) A method for increasing the dynamic range of a mass spectrometer having at least one quadrupole ion filter, an ion trap and a mass analyzer, comprising the steps of:
  - a. passing a first sample of ions through the quadrupole ion filter and the mass analyzer;
  - b. measuring the intensities of the mass spectrum of said first sample;
  - c. identifying undesired ions within said first sample from said measurement for ejection;
  - d. introducing a second sample of ions into the mass spectrometer;
  - e. applying the appropriate rf voltages to the quadrupole ion filter to eject the undesired ions;
  - f. accumulating desired ions in the ion trap,
  - g. transferring the desired ions from the ion trap to the mass analyzer, and
  - h. detecting the mass spectrum of the desired ions in the mass analyzer.

- 9) (original) The method of claim 8 wherein detecting the mass spectrum of the desired ions is performed in a mass analyzer selected from the group consisting of an ion trap mass spectrometer and a Fourier transform ion cyclotron resonance mass spectrometer.
- 10) (original) The method of claim 8 wherein the ejection of the undesired ions is accomplished by applying resonant rf-only voltages to the quadrupole ion filter selected from the group consisting of dipolar excitation, quadrupolar excitation, and parametric excitation.
- 11) (original) The method of claim 8 wherein steps a-h are repeated to detect further undesired ions for ejection.
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